IN THE CLAIMS:

The following list of claims replaces all prior listings and versions of claims in this application: claims 1, 2-9, 11-29, 35 and 45

1. (Previously Presented) A method of preparing a semiconductor wafer, which comprises:

providing a matching substrate that comprises a handling substrate and a matching layer on the handling substrate, the matching layer having a first lattice parameter on a first surface disposed opposite the handling substrate, and the handling substrate having a second lattice parameter that is different from the first lattice parameter;

creating a region of weakness in the matching layer, wherein the region of weakness is configured to facilitate splitting;

growing on the first surface of the matching layer a first strained layer of a first semiconductor material in a strained state to impart the same first lattice parameter in the first strained layer as in the matching layer;

associating a receiving substrate with the first strained layer to form a composite structure;

obtaining a product wafer and a donor wafer by splitting the composite structure at the region of weakness, wherein the product wafer includes the strained first layer and the receiving substrate and a retained portion of the marching layer on the first strained layer, while the donor wafer includes at least a portion of the matching layer;

smoothing roughness from the retained portion of the matching layer; and

selectively etching the smoothed portion of the matching layer from the first strained layer.

2. (Canceled)

3. (Original) The method of claim 1, wherein the matching layer includes a buffer layer and a relaxed surface layer on which the first strained layer is grown.

4. (Original) The method of claim 3, wherein the lattice parameter of the buffer layer is graded between the first and second lattice parameters.

5. (Original) The method of claim 1, wherein the region of weakness is created by implanting atomic species.

6. (Original) The method of claim 1, wherein the region of weakness is created by adding a porous layer.

7. (Original) The method of claim 1, wherein the lattice parameter of the first material when strained is different than the lattice parameter of the first material in a relaxed state.

8. (Original) The method of claim 1, wherein the receiving substrate is bonded to the first strained layer.

9. (Original) The method of claim 1, wherein the first strained layer is disposed directly adjacent an insulator on a side of the first strained layer on which the receiving substrate is disposed.

10-13 (Canceled)

14. (Original) The method of claim 1, wherein the first strained layer comprises silicon, and the matching layer comprises silicon germanium.

15. (Original) The method of claim 1, wherein the region of weakness is formed after the growing the first strained layer.

16. (Original) The method of claim 1, wherein the first strained layer is strained for modifying the energy band structure of the semiconductor material of that layer for

improving the electrical properties thereof compared to the semiconductor material in a relaxed state.

17. (Original) The method of claim 16, wherein the first strained layer has a thickness that is less than the critical thickness thereof for preventing substantial relaxation of strain.

18. (Original) The method of claim 17, wherein first strained layer has a thickness of less than about 20 nanometers prior to the splitting.

19. (Original) The method of claim 16, wherein the first strained layer has a charge carrier mobility that is at least about 50% higher than in the semiconductor material in a relaxed state.

20. (Original) The method of claim 1, further comprising providing a first strain-retaining layer on the first strained layer for maintaining strain from the side of the first strained layer opposite the matching layer.

21. (Original) The method of claim 20, wherein the first strain-retaining layer has the first lattice parameter.

22. (Original) The method of claim 21, wherein the matching and first strain-retaining layers are made of substantially the same material.

23. (Original) The method of claim 20, growing a second strained layer of semiconductor material on the first strain-retaining layer to impart the first lattice parameter therein.

24. (Original) The method of claim 23, further comprising providing a second strain-retaining layer on the second strained layer and having the first lattice parameter for

maintaining the strained state of the second strained layer from the side of the second strained layer opposite the first strain-retaining layer.

25. (Currently Amended) The method of claim 23, further comprising:

providing a region of weakness in the first strain-retaining layer;

transferring a second ~~the first strained~~ layer to a second ~~first~~ receiving substrate by splitting at the region of weakness in the first strain-retaining layer; and

transferring the first ~~second~~ strained layer to a first ~~second~~ receiving substrate ~~by splitting in the region of weakness in the matching layer~~.

26. (Original) The method of claim 20, wherein:

the first strained layer comprises first material; and

the first strain retaining layer comprises an oxide of the first material.

27. (Previously Presented) The method of claim 20, wherein the first strained layer comprises silicon and the first strain-retaining layer comprises silica, and the method further comprising associating the first strain-retaining layer with the silicon of the first strained layer prior to the splitting.

28. (Original) The method of claim 27, further comprising thickening the strained layer of silicon epitaxially after the splitting.

29. (Original) The method of claim 28, wherein the strained layer is thickened epitaxially after the splitting to a layer thickness of greater than about 40 nm.

30-34 (Cancelled)

35. (Previously Presented) A method of preparing a semiconductor wafer, comprising:

providing a matching layer, which has a first lattice parameter on a first surface of the matching layer, on a handling substrate, which has a second lattice parameter that is different from the first lattice parameter;

growing on the first surface of a the matching layer a first strained layer of a first semiconductor material in a strained state to impart the same first lattice parameter in the first strained layer as in the matching layer;

associating a receiving substrate with the first strained layer to form a composite structure; and

transferring the first strained layer from the matching layer to the receiving substrate by splitting the matching layer from the strained layer, such that the transferred strained layer is in a strained state and a retained portion of the marching layer is retained on the strained layer; and

smoothing roughness from the retained portion of the matching layer; and

selectively etching the smoothed portion of the matching layer from the strained layer.

36-44 (Canceled)

45. (Previously Presented) The method of claim 1, wherein the first strained layer of the product wafer in a strained state.

46-48 (Canceled)